

**Patent Claims:**

1. Device to carry out measurements in a vacuum chamber, in particular to measure thin layers, with a case, exhibiting at least one measurement window, to receive a measurement system, characterized by
  - a two part case with a first part of the case (21), which projects into the vacuum chamber (11, 12, 13), and a second part of the case (20), which is located outside the vacuum chamber (11, 12, 13),
  - means (28, 29) for the sealing and moveable arrangement of the case (20, 21) in the wall of the vacuum chamber (11, 12, 13),
  - an adjusting unit (25), engaging with the case (20, 21), and
  - a counterpull device (39), engaging with the second part of the case (20).
2. Device, as claimed in claim 1, characterized in that the means (28, 29) for the sealing and moveable arrangement of the case (20, 21) comprise bellows (28), resting against the outside of the wall of the vacuum chamber (11, 12, 13).
3. Device, as claimed in claim 1 or 2, characterized in that the counterpull device is a negative pressure chamber (39), adjacent to the second part of the case (20).
4. Device, as claimed in claim 3, characterized in that the negative pressure chamber (39) is connected from the viewpoint of pressure to the vacuum chamber (11, 12, 13).

5. Device, as claimed in claim 3 or 4, characterized in that the performance of the adjusting unit (25) is designed according to the weight of the case (20, 21) and the measurement system (34).
6. Device, as claimed in any one of the claims 1 to 5, characterized in that the measurement system (34) is disposed in the second part of the case (20), which is separated from the viewpoint of pressure from the first part of the case (21).
7. Device, as claimed in any one of the claims 1 to 6, characterized in that the first part of the case (21) is a vacuum adapter (21).
8. Device, as claimed in any one of the claims 1 to 7, characterized in that the measurement system (34) comprises at least one light source (30) or light feed and at least one detector (32).
9. Device, as claimed in claim 8, characterized in that the first part of the case is designed as a vacuum adapter (21) and exhibits a common beam tube (40) for at least one incoming and at least one outgoing beam (5).
10. Device, as claimed in claim 9, characterized in that the measurement window (45) comprises a prism and / or a lens system (41).
11. Device, as claimed in claim 9 or 10, characterized in that the vacuum adapter (21) terminates with at least one vacuum window (42) on the end of the beam tube (40) facing the measurement system (34).

12. Device, as claimed in claim 11, characterized in that a polarizer (43) is attached on the beam tube interior or beam tube exterior of the prism system (41) of the vacuum adapter (21).
13. Device, as claimed in any one of the claims 9 to 12, characterized in that in the beam tube (40) of the vacuum adapter (21) deflecting prisms (44) or mirrors (56) are disposed inside the vacuum adapter (21).
14. Device, as claimed in any one of the claims 1 to 13, characterized in that the measurement system (34) exhibits a measuring unit (53) and an adjusting unit (52) comprising at least one light source (48) and at least one position sensitive detector (46, 47).
15. Device, as claimed in claim 14, characterized in that the adjusting unit (52) exhibits an adjusting laser (48), a beam splitter (49) and two position sensitive detectors (46, 47).
16. Device, as claimed in any one of the claims 1 to 15, characterized in that it exhibits a rotating table (54) as the sample table.
17. Device, as claimed in claim 16, characterized in that the rotating table (54) is arranged on a linear table (55), whose direction of motion runs radially to the rotating table (54).
18. Device, as claimed in claim 16, characterized in that the deflecting prisms (44) or mirrors (56) are spaced in such a manner relative to the rotating table (54) that they can be moved linearly in the radial direction of the rotating table (54).

19. Vacuum adapter for devices to carry out optical measurements in a vacuum chamber, which exhibits a common beam tube (40) for at least one incoming and one outgoing beam (5), which terminates on one side with at least one vacuum window (42) and on the other side with a prism and / or lens system (41) and which exhibits means (29) to attach to the device.
20. Vacuum adapter, as claimed in claim 19, characterized in that a polarizer (43) is attached on the beam tube interior or beam tube exterior of the prism system (41).
21. Vacuum adapter, as claimed in claim 19 or 20, characterized in that additional deflecting prisms (44) are arranged in the beam tube (40).